

MDS Summer School: The Combinatorics of Linear and Semidefinite Programming

14-16 August 2012

Material and recommended reading

We suggest that you take a look at the following links provided by the lecturers to get a feeling for the background required to follow the lectures, which will cover some of the material contained, but also additional material. Refer also to the summer school website.

- Low discrepancy colorings and semidefinite programming (lecture by Nikhil Bansal)
 - Nikhil Bansal. Semidefinite Optimization in Discrepancy Theory. Math. Programming.
- Diameter of polytopes and the Hirsch Conjecture (lecture by Francisco Santos)
 - Edward Kim, Francisco Santos. An update on the Hirsch conjecture.
 - —. Companion to "An update on the Hirsch conjecture".

Those interested in the counterexample to the Hirsch conjecture (although the course will be more about the context) can also look at

- Francisco Santos. A counterexample to the Hirsch conjecture. *Annals of Mathematics*.
- Randomized pivoting rules for the simplex algorithm (lecture by Uri Zwick)
 - Gil Kalai. A subexponential randomized simplex algorithm (extended abstract). *STOC 1992*: 475-482
 - Jirí Matousek, Micha Sharir, Emo Welzl. A Subexponential Bound for Linear Programming. *Algorithmica* 16(4/5): 498-516 (1996)
 - Oliver Friedmann, Thomas Dueholm Hansen, Uri Zwick. Subexponential lower bounds for randomized pivoting rules for the simplex algorithm. *STOC 2011*: 283-292

Traveling information

There will be a bus transfer from Berlin to Döllnsee and back. Please be at the designated meeting point in time to ensure timely departure and arrival in Döllnsee. It is your responsibility to provide sufficient slack in your travel plans so that you will arrive the meeting point **before** the departure time.

Departure from Berlin: August 13, 16:00 sharp

Location: between the TU Berlin main building and the mathematics building (Straße des 17. Juni 136, 10623 Berlin)

Arrival in Berlin: August 17, around 10:30, same place

Please inform us via email in case you are planning not to take the bus and travel to Döllnsee by your own means of transportation.

Accommodation

The summer school will take place at:

Hotel Döllnsee-Schorfheide

Döllnkrug 2, 17268 Templin

For further information on the location, please visit <http://www.doellnsee.de>. All participants will be sharing double rooms.

Meals

Full board (breakfast, lunch, dinner, coffee breaks) will be provided during the summer school. If you have any special needs and wishes regarding your meals, please inform us via email.

Clothes

We recommend that you prepare for the possibility of rain, but also for sunny weather and swimming: the hotel is next to a lake. Don't forget sunscreen!

Contact information

If you have any remaining questions before the start of the summer school, please contact us by mail at summerschool2012@math.tu-berlin.de. If something goes wrong on your way to the summer school, or in another case of **emergency**, call +49 176 61991607.

Schedule

Monday, 13.8.

16:00 Departure by bus from TU Berlin
17:45 Arrival at Hotel Döllnsee
18:45 Dinner

Tuesday, 14.8.

9:00 - 10:30 Nikhil Bansal: Low discrepancy colorings and semidefinite programming
Coffee break
11:00 - 13:00 Exercise session
13:15 Lunch
14:30 - 16:00 Uri Zwick: Randomized pivoting rules for the simplex algorithm
Coffee break
16:30 - 18:30 Exercise session
18:45 Dinner, presentation of solutions

Wednesday, 15.8.

9:00 - 10:30 Nikhil Bansal: Low discrepancy colorings and semidefinite programming
Coffee break
11:00 - 13:00 Exercise session
13:15 Lunch
14:30 - 16:00 Francisco Santos: Diameter of polytopes and the Hirsch Conjecture
Coffee break
16:30 - 18:30 Exercise session
18:45 Dinner, presentation of solutions

Thursday, 16.8.

9:00 - 10:30 Uri Zwick: Randomized pivoting rules for the simplex algorithm
Coffee break
11:00 - 13:00 Exercise session
13:15 Lunch
14:30 - 16:00 Francisco Santos: Diameter of polytopes and the Hirsch Conjecture
Coffee break
16:30 - 18:30 Exercise session
18:45 Dinner, presentation of solutions

Friday, 17.8.

8:30 Departure by bus from Hotel Döllnsee
10:15 Arrival at TU Berlin